

Williams et al. Application No. 10/668,451

Reply to Office Action

REMARKS

The Office Action dated December 19, 2005, and the references cited therein have been carefully considered. Claims 1-20 are presently pending. No claims currently stand allowed. Applicants have amended a number of the claims for purposes of clarity, to distinguish between the scope of claims 1 and 12, and to make clear the distinctions between the claimed invention and the prior art. In particular, Applicants have amended independent claims 1 and 12 to make clear that, as disclosed in the specification, the plurality of wires are coupled to the *sensor assembly*, and the wires carry signals transmitted from, and received by, processor equipment when the sensor catheter is utilized in its intended operational environment. Thus, according to the amended independent claims 1 and 12, wires from *each* of the first and second bundles are coupled to the sensor assembly to support bi-directional signal transmissions along the plurality of wires. Nowhere does Ferrera U.S. Patent No. 6,168,570 disclose wires from the first and second wire bundles being coupled to the sensor assembly (as recited in pending independent claims 1 and 12). Nor does the prior art disclose/suggest that wires connected in the above-described manner support bi-directional signal transmissions. For at least these reasons, as well as reasons provided herein below, the pending claims are patentable over the prior art presently known to Applicants. Accordingly, Applicants request favorable reconsideration of the previous rejection of the now pending claims. Please charge any fees to Deposit Account No. 12-1216.

Summary of the Claim Rejections

The following identifies the authority and prior art applied to the identified claims for each rejection of the claims set forth in the Office Action dated March 21, 2005.

1. **Sections 5-7:** Claims 1-4, 7-9, 12-14 and 17-19 are rejected under Section 102(b) as being anticipated by Ferrera U.S. Pat. No. 6,168,570 (the Ferrera '570 patent).
2. **Sections 8-11:** Claims 5, 6, 10, 11 (note typographical error in the office action), 15, 16, and 20 are rejected under 35 U.S.C. Section 103(a) as being obvious over Ferrera in view of Danisch et al. U.S. Pat. No. 6,563,107 (the Danisch '107 patent).
3. **Section 12:** Claims 1, 3, and 12 are further rejected under 35 U.S.C. Section 103(a) as being obvious over Ferrera in view of Osadchy et al. U.S. Pat. No. 6,266,551 (the Osadchy '551 patent).

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For the reasons set forth below, Applicants traverse the previous rejection of all the claims in view of the amendments incorporated into the now pending claims.

Applicants' Responsive Comments

Applicants traverse the rejection in Sections 5-7 of the Office Action of claims 1-4, 7-9, 12-14 and 17-19 as anticipated by the Ferrera '570 patent. Applicants disclose and claim a sensor assembly disposed at a distal end of a catheter. Signals are carried along the length of the wire (between proximal and distal ends) by a plurality of wires that are coupled to the sensor assembly. Furthermore, the plurality of wires connected to the sensor assembly are divided into at least first and second wire bundles wherein wires within the bundles are twisted together to reduce electromagnetic interference (e.g., cross-talk) effects on signals carried by the wire bundles.

Ferrera discloses a micro-cable 10 that is insertable within a catheter. The micro-cable 10 can indeed comprise a set of bundled, twisted elements. As noted by the Office Action, Ferrera does indeed disclose, at col. 8, lines 39-43, the micro-cable 10 can comprise multiple cables to provide desired bending and strength characteristics. Ferrera furthermore notes in passing, at col. 9, lines 39-45, that the micro-cable can be a composite cable that includes a sensing element. The Ferrera '570 patent even identifies a variety of sensing elements carried by the micro-cable.

Ferrera does not disclose a number of specifically recited elements of presently pending independent claims 1 and 12 that address signal interference issues. The Ferrera '570 patent does not disclose "a plurality of wires coupled to the sensor assembly." The multiple wires in Ferrera are intended to provide flexibility (see, e.g., col. 8, lines 39-43). The primary example does not even carry an electronic data signal. To the extent that Ferrera discloses a sensor, it does not state that multiple wires are connected to the sensor. Nor does Ferrera disclose that multiple wires are used to carry signals that may be susceptible to interference (e.g., cross-talk). Furthermore, in contrast to the invention recited in claims 1 and 12, Ferrera does not disclose that wires from at least first and second wire bundles are coupled to the sensor assembly.

The Ferrera '570 patent does not disclose a number of elements relating to connecting multiple wires, from first and second twisted wire bundles, to a sensor assembly mounted on a distal end of a catheter. In the event that the rejection of claims 1 and 12 is not withdrawn, Applicants request identification of the specific teachings in Ferrera that multiple wires, from

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at least first and second twisted wire bundles, are connected to a sensor assembly. Applicants respectfully submit that Ferrera, directed primarily to physical manipulation of a micro-coil, neither discloses nor even remotely suggests such wiring arrangement.

Furthermore, Ferrera does not disclose a "sensor catheter" as recited in claims 1 and 12. Applicants' claimed invention is directed to a sensor catheter that includes a sensor assembly and the recited plurality of wires. In contrast, Ferrera discloses a micro-cable that is fed within a separate and distinct "micro-catheter." Thus, to the extent that a sensor is disclosed by Ferrera, such sensor is mounted upon the disclosed micro-cable rather than a catheter (as recited in the claims). For at least this additional reason Ferrera does not anticipate any of the presently pending claims.

With regard to the Office Action's assertion in the last sentence of section 6, Applicants agree that use of a twisted pair arrangement to enhance signal interference immunity is a well known principle. However, Applicants are unaware of any such appreciation of the beneficial effects of bundling signal wires to enhance signal interference immunity in the context of the presently claimed invention where a set of wires associated with a sensor are divided into multiple bundles of twisted wires providing bi-directional data signal paths between the sensor assembly and a connected processor. In the event that the present rejection of the claims is not withdrawn, Applicants respectfully request identification of teachings in the prior art of such benefits in the context of such catheter mounted sensors including bi-directional signal paths.

Applicants traverse the anticipation rejection of claims 2-4, 7-9, 13, 14, and 17-19 for at least the reasons set forth above. Furthermore, Applicants submit that Ferrera does not disclose the element of twisting the bundles together as recited in claims 2, 9, 13, and 19. Applicants submit that Ferrera does not disclose that the third bundle consists of three wires as recited in claim 8 and 18.

Turning to the obviousness rejection of claims 5-6, 10-11, 15, 16, and 20, Applicants traverse the rejection for at least the reasons provided herein above with regard to independent claims 1 and 12 from which these claims depend. Furthermore, Applicants traverse the Office Action's assertion that Danisch discloses the recited wire twisting schemes in the context of a sensor catheter including bi-directional signal paths supported by the plurality of wires. In the event that the rejection is not withdrawn, Applicants request

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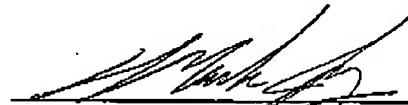
identification of a sensor catheter within the Danisch patent as asserted in sections 10 and 11 of the Office Action.

Applicants furthermore traverse the rejection of claims 1, 3 and 12 in section 12 of the Office Action over Ferrera in view of the Osadchy '551 patent. In particular, neither Ferrera nor Osadchy discloses the combination of multiple wires coupled to a single sensor assembly that are in turn grouped into first and second twisted wire groups and wherein the signal wires carry signals both to and from the sensor assembly.

Conclusion

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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